

ABSTRACT OF THE INVENTION:

The present invention provides a noise barrier apparatus for inhibiting external noise from causing the presence of noise in an audio chamber defined by a noise barrier device and including the user's ear canal. The noise barrier apparatus may be constituted by an in-ear noise barrier device or devices or an over-the-ear device or devices. An in-ear application of the present invention provides an in-ear-canal audio receiver comprising an in-ear-canal adapter body having a tapered ear plug portion that is inserted into the user's ear canal. The adapter body further has an opening in the plug portion, an exterior annular indent, and an inner chamber coupled to the opening of the plug portion. The inner chamber of the in-ear-canal adapter body holds a transducer assembly comprising a transducer housing and a transducer or speaker. The transducer is positioned in a passage extending through the transducer housing. A torus-shaped cushion is positioned in the annular indent of the in-ear-canal adapter body. The cushion provides comfort and establishes a good seal with the user's ear, and also provides mechanical damping to inhibit propagation of external acoustic pressure waves via the noise barrier device to an audio chamber including an interior of the noise barrier device and the user's ear canal. An over-the-ear application of the present invention provides an ear cup and has a torus-shaped cushion at an interface part thereof which bears against the side of the user's head at an area surrounding the user's ear. The cushion again provides comfort, establishes a good seal with the user's head and provides mechanical damping to inhibit propagation of external acoustic pressure waves via the noise barrier device to an audio chamber including an interior of the noise barrier device and the user's ear canal. The cushion is preferably formed of a material which is at least partially plastically deformable and provides a damping ratio greater than 0.75.